Abstract

An integrated test core for mixed-signal circuits comprises a periodic waveform generator capable of generating arbitrary band-limited waveforms for excitation purposes and a waveform digitizer for extracting an arbitrary waveform from the test circuit's analog response signal. The digitized response may be tested and measured using DSP techniques. Preferably, the waveform generator and digitizer are synchronously controlled. The core is a nearly all digital implementation with the exception of a reconstruction filter (optional) for sending the test signal to the circuit under test (CUT) and the comparator for extracting the digitized waveform from the CUT's response. The periodic waveform generator may comprise a $\Sigma\Delta$ modulator and, optionally, a reconstruction filter between the modulator and CUT. The waveform digitizer may comprise a programmable reference voltage generator for providing a variable voltage reference signal, a comparator for generating a comparison signal from the CUT's analog response signal and the reference signal and means for controlling the reference voltage generator.